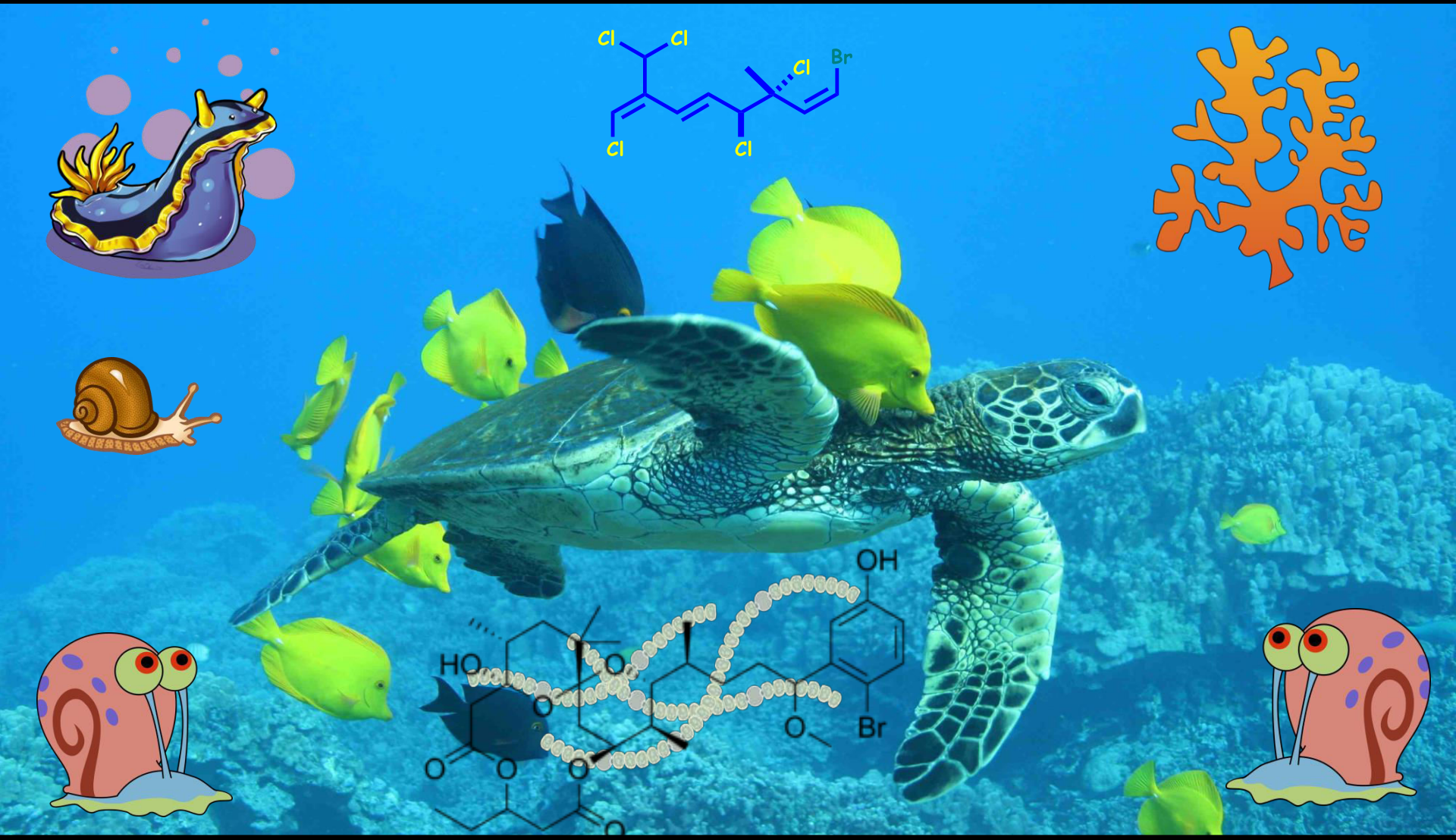
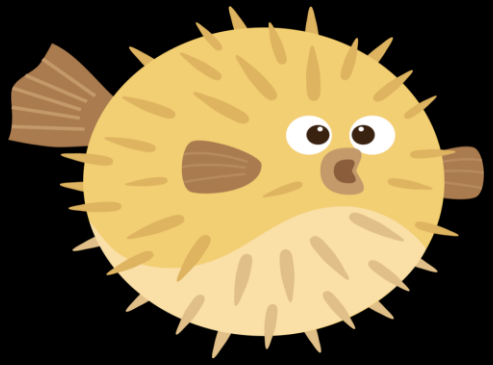
Marine Chemical Ecology

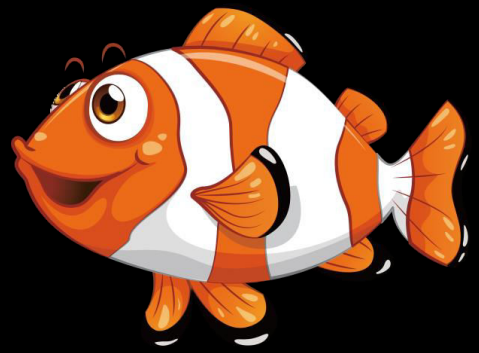


Dr. Omar M. Sabry

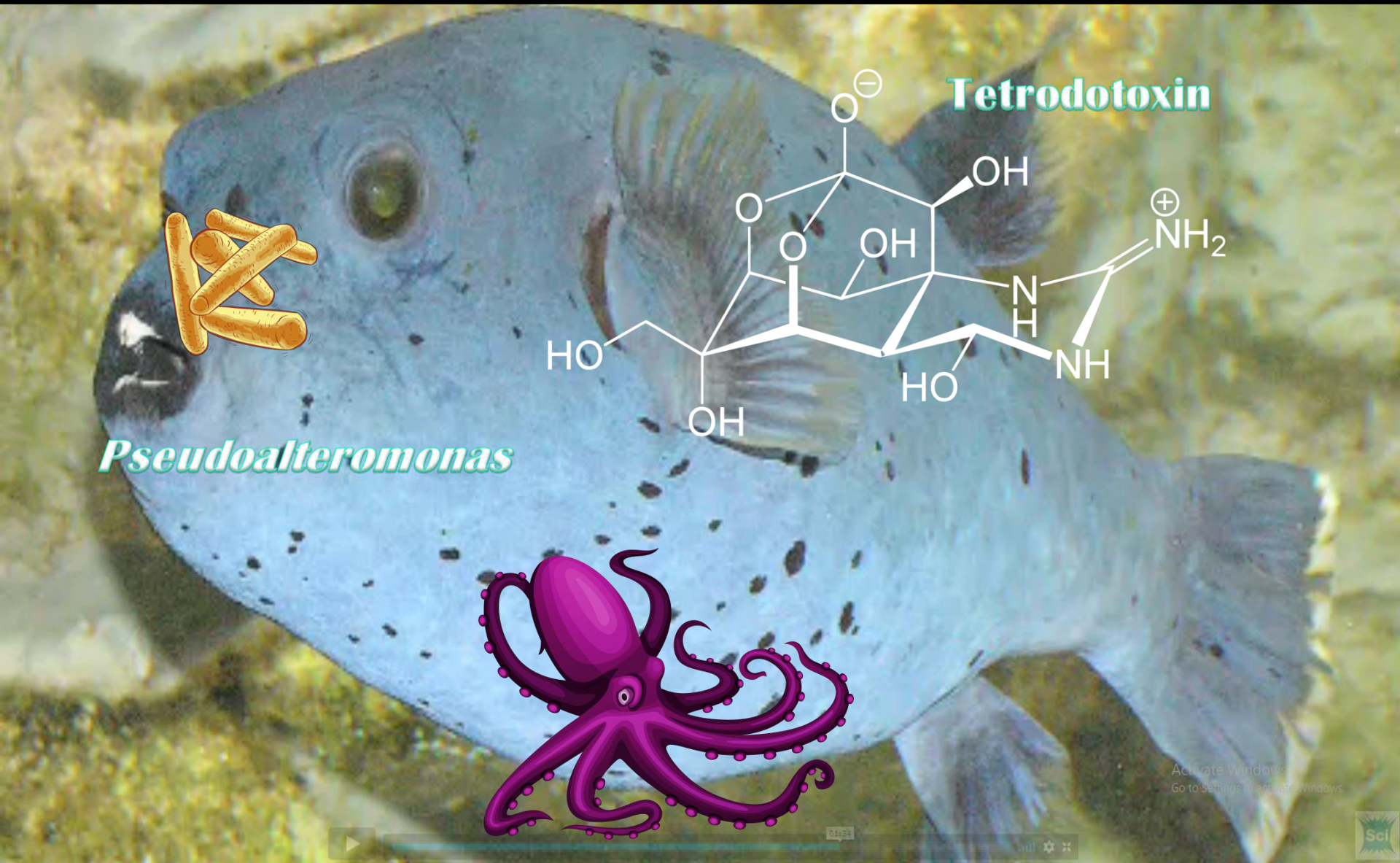
Marine Chemical Ecology

- New science deals with the chemical interactions between living marine organisms with each other and with the environment



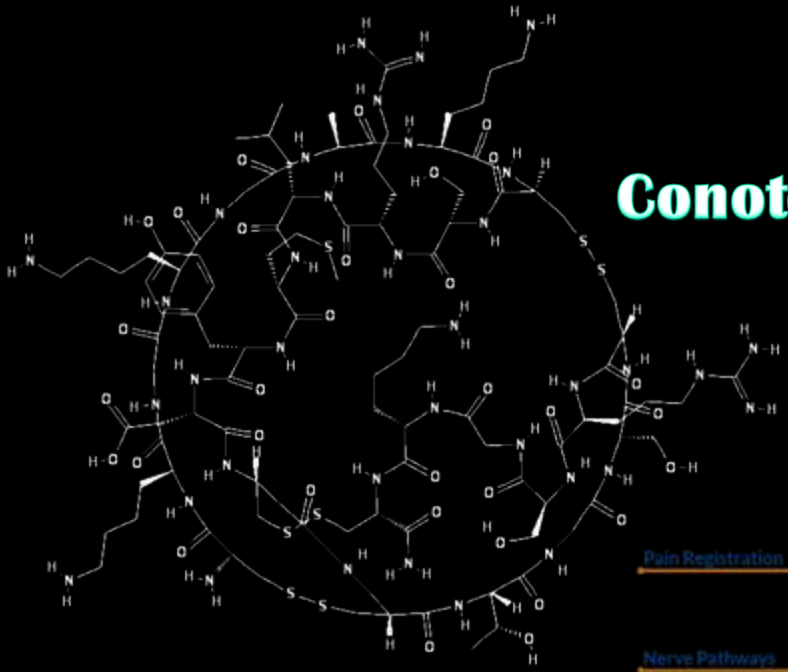


Tetrodotoxin, Puffer Fish and *Pseudoalteromonas*



Cone Snail, Fish and ω-Conotoxin

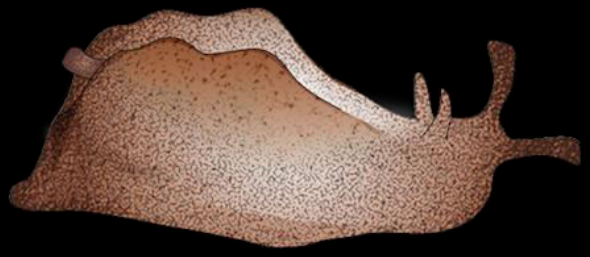
Cone Snail



Conotoxin

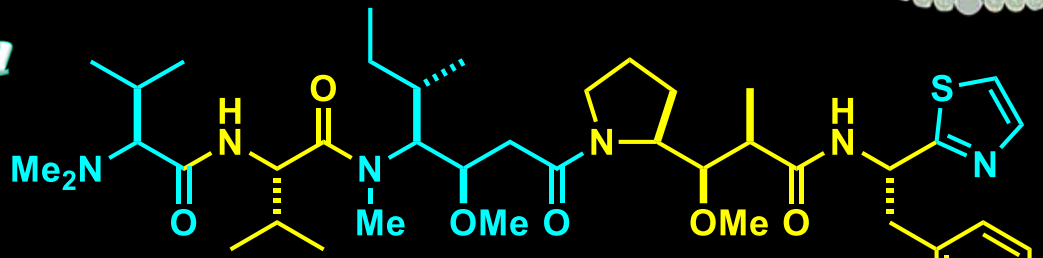
Pain Killing Action

Dolastatin 10, *Dolabella auricularia* and Cyanobacteria

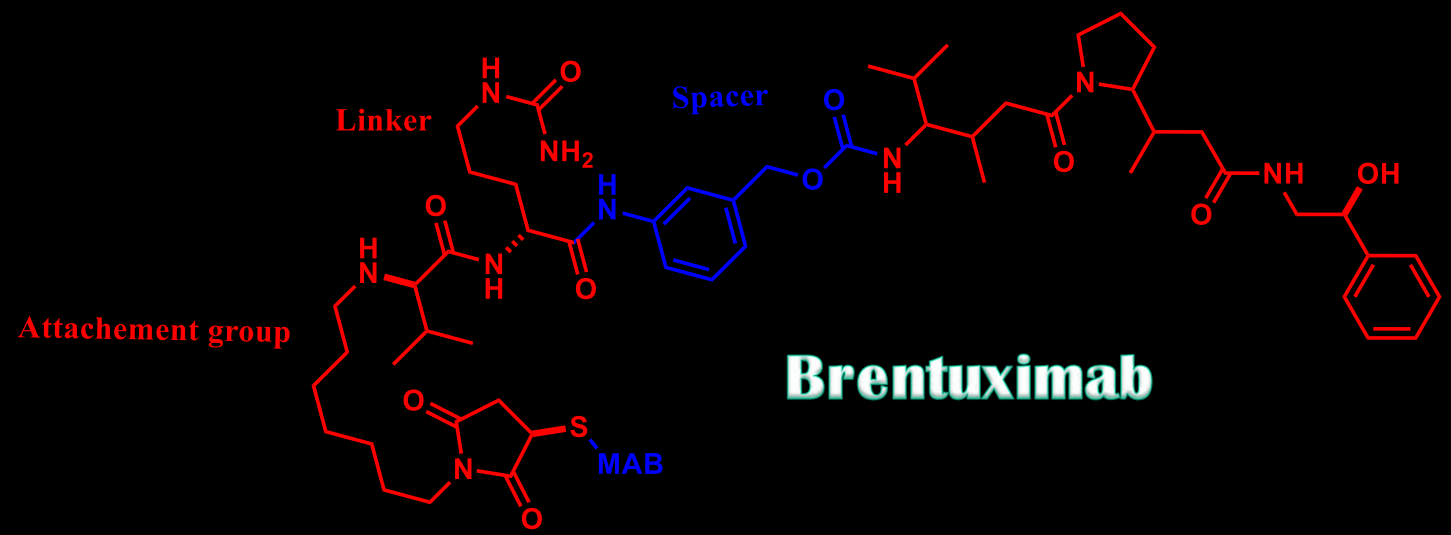


Dolabella

Cyanobacteria



Dolastatin 10



Brentuximab

Cyanobacteria or Blue Green Algae?

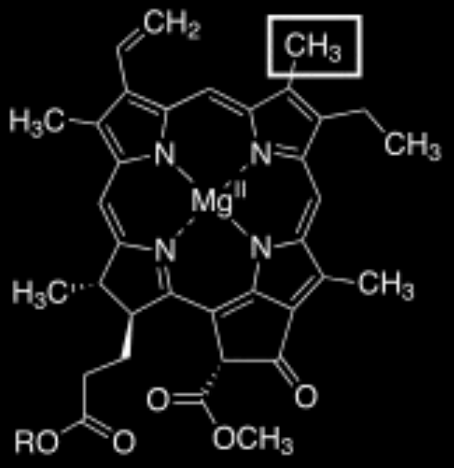
- **Cyanobacteria**

  Peptidoglycans + mixture of pigments

- **Blue Green Algae**

  Chlorophyll + photosynthesis.

Cyanobacteria



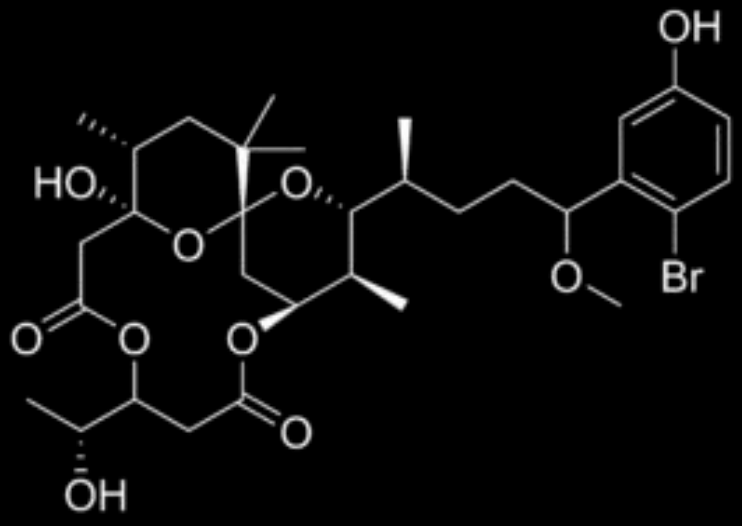
Chlorophyll A

Aplysiatoxin, Sea Hare and Blue Green Algae

- Aplysiatoxin isolated from sea hare gut {*Stylocheilus longicauda*}
- Aplysiatoxin biosynthesized by blue green alga
- Aplysiatoxin is a tumor-promotor large dose

Sea hare

Cyanobacteria



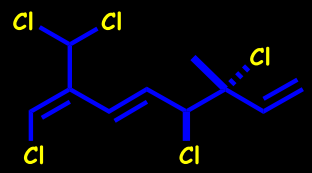
Aplysiatoxin

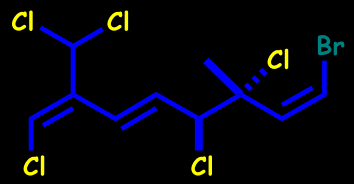
Polyhalogenated Monoterpenes, Nudibranchs and Red Algae

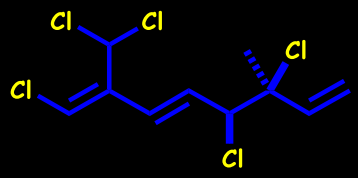
Snails
Mollusks

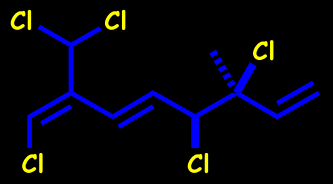
Phyllidia coelestis

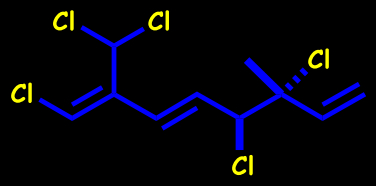
Red Alga
Plocamium

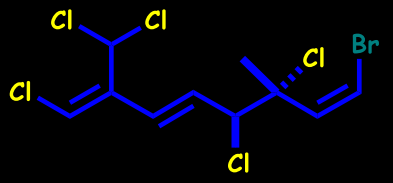


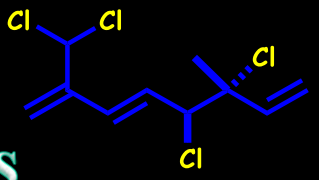










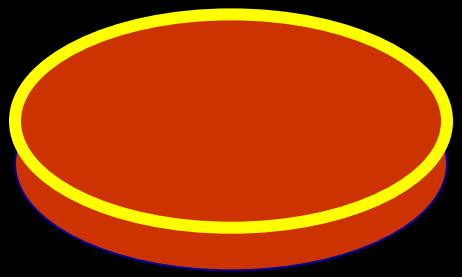


Halogenated Monoterpenes

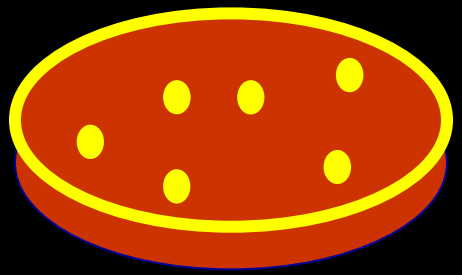
Brine Shrimp Eggs, Alteromonas and Fungi

Shrimp eggs

Altermonas



Nutrient Media

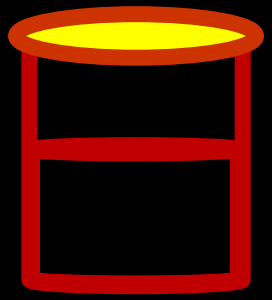


Isolation of M.O

Altermonas

Brine Shrimp Eggs, Alteromonas and Fungi

Shrimp eggs

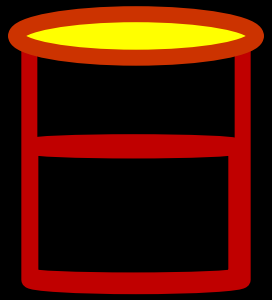


Sea water

Hatch

80% Survival

Shrimp eggs

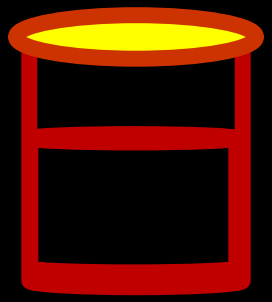


Sea water + Penicillin

Hatch

0% Survival

Shrimp eggs
+ Penicillin



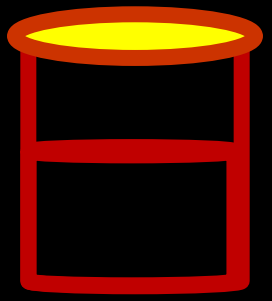
Sea water + Altermonas extract

Hatch

60% Survival

Brine Shrimp Eggs, Alteromonas and Fungi

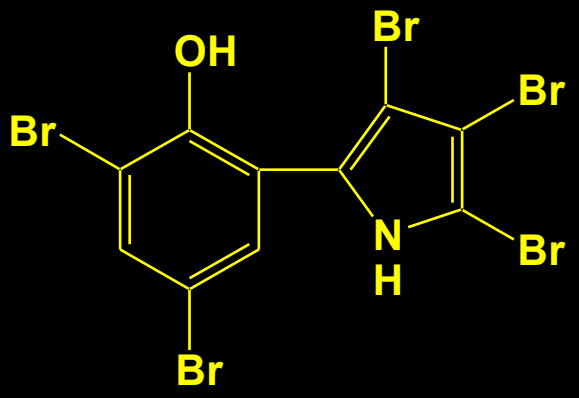
Shrimp eggs
+ Penicillin



Hatch

60% Survival

Sea water + Altermonas extract

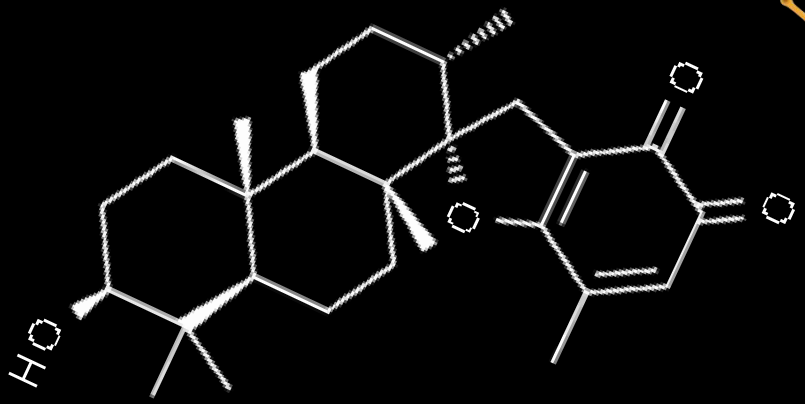


Pentabromo-hydroxy-phenyl pyrrole

- Active *in-vitro* against Fungi MIC= 0.006ug/ml
- Inactive *in-vivo*

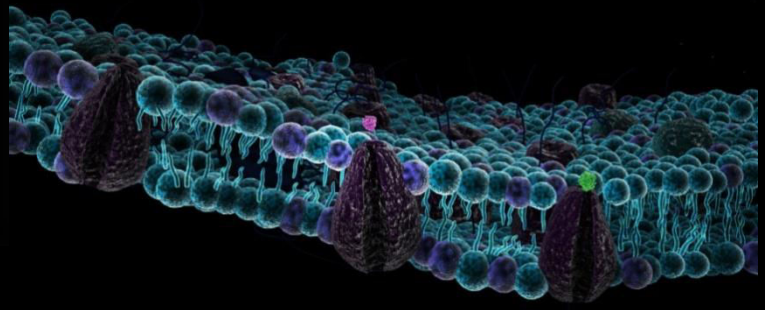
Stypoldione, Ichtyotoxic Activity and Epilepsy

Stypopodium zonale



Stypopoldione

Snails
Mollusks



Sodium channel Blocker

Thank You!